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BIOGRAPHY.

PROFESSOR WILLIAM HOOVER, A. M., Ph. D.

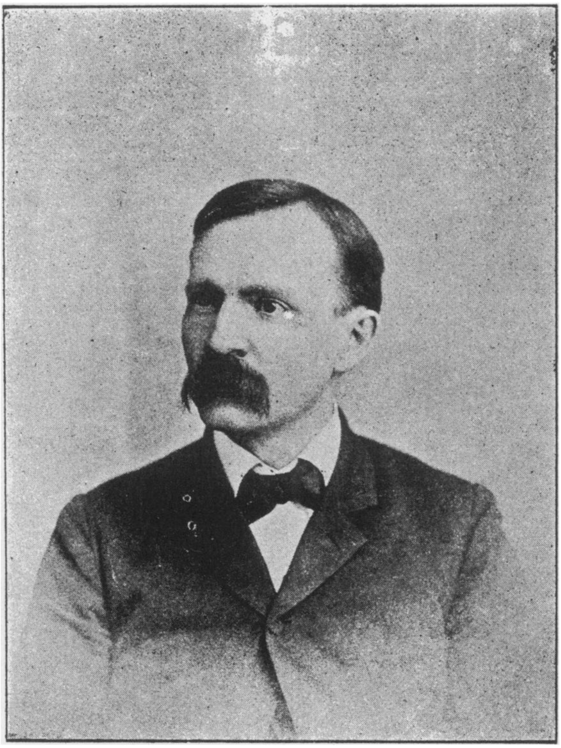
Professor Hoover was born in the village of Smithville, Wayne county Ohio, October 17, 1850, and is the oldest of a family of seven children. Both parents are living in the village where he was born, still enjoying good health.

Up to the age of fifteen he attended the public schools, and for two or three years after, a local academy. Owing to needy circumstances he was obliged to work for his living quite early, and almost permanently closed attendance at any kind of school at eighteen years of age, sometime before which, going into a store in the county seat, as clerk. Nothing could have been farther from his taste than this work, having been thoroughly in love with study and books long before. After spending two or three years in this way, he went to teaching, about the year 1869, and he has been regularly engaged in his favorite profession to the present day.

He attended Wittenberg College and Oberlin College one term each, a thing having very little bearing on his education. He studied no mathematics at either place, excepting a little descriptive astronomy at the latter.

After teaching three winters of country school, with indifferent success, he was chosen, in 1871, a teacher in the Bellefontaine, Ohio, High School, serving one year, when he was given a place in the public schools of South Bend, Ind. Remaining there two years, he was invited to return to Bellefontaine as superintendent of schools. He afterwards served in the same capacity in Wapakoneta, O., two years, and as principal of the second district school at Dayton, O. In 1883, he was elected professor of mathematics and astronomy in the Ohio University, Athens, Ohio, where he is still in service.

Through all his career of teaching, Professor Hoover has been an incessant student, devoting himself largely to original investigations in mathematics. Although his pretentions in other lines are very modest, he is eminently proficient in literature, language, and history. Before going into college work he



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had collected a good library. He is indebted to no one for any attainments made in the more advanced of these lines, but by indefatigable energy and perseverance he has made himself the cultured, classic, and renowned scholar he is.

He has always been a thorough teacher, aiming to lead pupils to a mastery of subjects under consideration. His habits of mind and preparation for the work show him specially adapted to his present position, where he has met with great success. He studies methods of teaching mathematics, which in the higher parts is supposed to be dry and uninteresting. He sets the example of enthusiasm as a teacher, and rarely fails to impress upon the minds of his students the immense and varied applications of mathematics. He is kind and patient in the class-room and is held in the highest esteem by his students. He is ever ready to aid the patient student inquiring after truth. It seems to be a characteristic of eminent mathematicians that they desire to help others to the same heights to which they themselves have climbed. This was true of Professor Seitz; it is true of Dr. Martin; and it is true of Professor Hoover.

In 1879, Wooster University conferred upon Professor Hoover the degree of Master of Arts, and, in 1886, the degree of Doctor of Philosophy *cum laude*, he submitting a thesis on Cometary Perturbations. In 1889, he was elected a member of the London Mathematical Society and is the only man in his state enjoying this honor. In 1890, he was elected a member of the New York Mathematical Society. He has been a member of the Association for the Advancement of Science for several years. Papers accepted by the association at the meeting at Cleveland, Ohio, and at Washington, D.C., have been presented on "The Preliminary Orbit of the Ninth Comet of 1886," and "On the Mean Logarithmic Distance of Pairs of Points in Two Intersecting Lines." He is in charge of the correspondence work in mathematics in the Chautauqua College of Liberal Arts and of the mathematical classes in the summer school at Lake Chautauqua the principal of which is the distinguished Dr. William R. Harper, president of the new Chicago University. The selection of Professor Hoover for this latter position is of the greatest credit, as his work is brought into comparison with some of the best done anywhere.

He is a critical reader and student of the best American and European writers, and besides, is a frequent contributor to various mathematical journals, the principal of which are *School Visitor*, *Mathematical Messenger*, *Mathematical Magazine*, *Mathematical Visitor*, *Analyst*, *Annals of Mathematics*, and *Educational Times* of London, England.

His style is concise and his aim is elegance in form of expression of mathematical thought. While greatly interested in the various branches of pure mathematics, he is specially interested in the applications to the advanced departments of Astronomy, Mechanics, and the Physical Sciences—such as Heat, Optics, Electricity, and Magnetism. The "electives" offered in the advanced work for students in his University are among the best mathematics pursued any where in this country.

He is an active member of the Presbyterian church and greatly interested in every branch of church work. He has been an elder for a number of

years and was chosen a delegate to the General Assembly, meeting at Portland, Oregon, in May, 1892, serving the church in this capacity with fidelity and intelligence. In this biography of Professor Hoover, there is a valuable lesson to be learned. It is this: energy and perseverence will bring a sure reward to earnest effort. We see how the clerk in a county-seat store, in embarassing circumstances and unknown to the world of thinkers, became the well known Professor of Mathematics and Astronomy in one of the leading Institutions of learning in the State of Ohio. "Not to know him argues yourself unknown."

[From *Finkel's Mathematical Solution Book.*]

APPLICATION OF THE NEW EDUCATION TO THE DIFFERENTIAL AND INTEGRAL CALCULUS.

By FLETCHER DURELL, Ph. D., Professor of Mathematics, Dickinson College, Carlisle, Pennsylvania.

[Continued from the January Number]

If the quantity which has been represented by curves may also be regarded as existing independently of any spacial arrangement, its magnitude and magnitude relations in both cases being the same, the formulas of differentiation obtained above apply to both; that is, they apply to functions as well as to curves. The student may at once be brought to realize the greater flexibility and freedom of treatment obtained by using them functionally. We thus arrive at the more general definition of differentiation, $\frac{dy}{dx}=\text{limit}\frac{f(x+\Delta x)-f(x)}{\Delta x}$.

The process of determining the slopes of curves by the above geometrical method, and the use of the related variables as auxiliary quantities determining the slopes by exact contact, and the practice in constructing tangents to the curves by the use of these slopes, build up firm and exact and vivid conceptions of the quantities dealt with. When the student comes to take up the more general idea of functional quantities, arranged irregularly or indefinitely in space, the geometrical conceptions already formed aid in giving firmness and reality to the quantities dealt with as differential coefficient, and a sense of the absolute precision of their values as determined by variables moving up into contact with them.

However at the outset of each division of the subject, as in dealing with partial differentiation, series, indeterminate expressions so-called, etc, it is best to establish properties in the geometrical form if only for the double light that is thrown on them. Space will not permit us to show in detail how this is done, and we will but illustrate these further applications of the method by giving a proof of Taylor's Formula with Remainder. In Fig. 5, let (I), or PQ, be the section of the surface, $u=f(x+y)$ made by the ux-plane. Since this surface slopes in the same way from the xy—plane, as it does from the uy—plane, this one trace may be taken as an adequate representation of the whole surface for the present purpose.